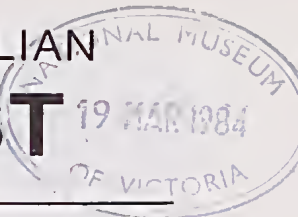


# THE WESTERN AUSTRALIAN NATURALIST



Vol. 15

November 30, 1983

No. 7

## CONSTRUCTION OF A TWENTY-FOUR HOUR ACTIVITY BUDGET FOR PACIFIC BLACK DUCK BY MEANS OF NIGHT VISION BINOCULARS

By HUGO BEKLE, Department of Geography, University of Western Australia,  
Nedlands, 6009.

### ABSTRACT

Night vision binoculars were used on 5 and 6 April, 1982 to record the nocturnal behaviour of a small population of Pacific Black Duck, *Anas superciliosa*, near Perth, Western Australia. Four classes of activities (comfort movements, loafing, feeding and swimming) were investigated over a complete daily cycle. Most time was devoted to feeding, and ducks were found to feed intensively during the night.

Behavioural studies of water fowl in Australia have been limited to daytime. Results from northern Queensland on Grey Teal *Anas gibberifrons* (Lavery, 1972), and from Victoria on Pacific Black Duck, Chestnut Teal *A. castanea* and Grey Teal (Norman *et al.*, 1979) have shown an increase in feeding towards sunset, but night feeding had remained unconfirmed. This is mostly due to the lack of accurate observations at night. An attempt in New Zealand to investigate night feeding by Brown Teal *A. aucklandica chlorotis* was unsuccessful because the birds were disturbed by the use of a flashlight; however, some individuals were reported to feed at night (Weller, 1974). Activity budget studies on the European Green-winged Teal *A. crecca carolinensis* and Pintail *A. acuta* in North America (Tamisier, 1976), showed that feeding was insignificant during the day, when these species flocked in large concentrations on resting areas where they were mostly observed sleeping, preening and swimming. In the evening the whole population of the resting area dispersed, and ducks flew off in separate groups to their nocturnal feeding grounds.

Tamisier (1972) commenced using night vision aids (an infra-red telescope) in about 1968 for observations of nocturnal feeding by Teal in the Camargue, France. Similar observations were reported from the U.S.A. in the same year (Swanson and Sargeant, 1972). All common species of ducks breeding in the prairies of North Dakota were observed, for the period June to September, to feed at night. Most recently, Pedrolì (1982) described the activities of Tufted Ducks *Aythya fuligula* wintering in Switzerland; nocturnal observations (including feeding) were collected during 1977-78 using a night vision scope. However, the importance of this work and the availability of night vision aids for nocturnal studies appear to have been largely overlooked. Behavioural studies of waterfowl are still concerned almost exclusively with diurnal patterns of activity, and the extent of night feeding has not been adequately determined (Dwyer, 1975; Skead, 1977; Norman *et al.*, 1979).

The aim of this study was to establish the existence of night feeding in an Australian species of *Anas*, to quantify its nocturnal activities and incorporate them into an overall time budget. Observations were made on Pacific Black Duck at a small unnamed wetland (about 0.5 ha), 7 kilometres north-east of Perth at 31°55'S, 115°54'E. It is artificially maintained and functions as a drainage compensating basin. This area was selected because it supported only a small number of ducks which were easily detected, enabling systematic nocturnal observations to be made. The activities of Pacific Black Duck were studied over a period of 25.5 hours between 0600 hours on 5 April and 0730 hours on 6 April 1982. Sunset occurred at 1808 hours and sunrise at 0630 hours. Observations were made over a few minutes every half hour using 10 x 50 binoculars during daylight, and night vision binoculars during darkness. These passive binoculars (type PB405) were on loan from the Western Australian Department of Agriculture. Its operation is passive: objects can be

observed even in the darkest night, without any artificial illumination. Battery-powered and self-contained, they electronically intensify ambient light so that the total light gain achieved is in excess of 15,000 times.

Duck activities were assigned to one of four categories: feeding, loafing (resting and sleeping), comfort movements (preening and bathing) and swimming. The activities recorded during the 52 counts and incorporating 525 actions of individuals are summarised in Fig. 1. Several major trends were apparent. Feeding (14 hrs) occupied the greater part of a 24-hour period, much more than the total time spent swimming (3 hrs), and comfort movements (a total of only 2 hrs). Most daytime feeding took place in the first few hours after sunrise, decreased thereafter, to recommence in the mid afternoon, and continued to increase towards sunset. During the day the main feeding methods, in descending order of importance, included: swimming with head and neck submerged, upending, and pecking at food on water or land. Ducks were recorded feeding on the grassy banks in the morning, and stripping seeds from sedges (*Lepidosperma longitundale*) growing along the periphery of the wetland. Later in the day and at night, feeding was limited to the muddy margins and open water.

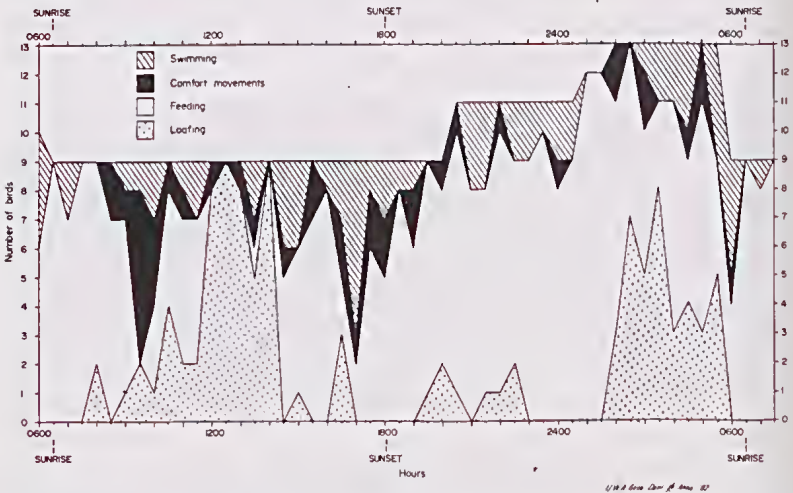


Figure 1. Activities of Pacific Black Duck observed at unnamed wetland (31°55'S, 115°54'E) during a period of 25.5 hours.

Table 1 shows that approximately 2 thirds of the total feeding time was during the night. Nocturnal feeding appeared to peak between sunset and just after midnight, but some feeding was observed at all hours. On the night of the observations, the moon was three days short of full, rising at about 1630 hours and setting at about 0400 hours (when nocturnal feeding was at a minimum). As little evidence of benthic vegetation could be found, ducks apparently concentrated on invertebrates either on the water's surface or on the bottom. Nocturnal feeding behaviour varied between swimming slowly with bill under the water dredging the muds and occasionally filtering or chasing surface insects. The fact that 57.7% of a 24 hour period was occupied with feeding can be at least partly explained by the paucity of aquatic plants and that invertebrates are collected less economically, requiring more active and prolonged feeding.

Loafing, the second most common activity, and comfort movements consist of leisurely actions demanding little energy compared to feeding or swimming. Both classes of activities occupy a greater proportion of the day than the night, particularly comfort movements (65.9% of the day). The number of Pacific Black Duck loafing increased after sunrise, with most birds resting in the 1200 to 1400 hour period. Low levels of loafing were maintained throughout the afternoon and into the night, until another smaller peak was observed between 0200 and 0530 hours. Most ducks spent the day loafing on the grassy verge



Activity Class	Day	Night
feeding	36.5	63.5
loafing	55.3	44.7
swimming	46.8	53.2
comfort	65.9	34.1

**Table 1.** Percentage of each activity divided between day and night.

under the shade of Willow trees, but at night they remained partially or completely surrounded by water, selecting either the mud banks at the water's edge or floating on the open water. Feather maintenance occurred at low levels throughout the day and night, but intensive preening was observed mostly between 0900 and 1000 hours. This period devoted mainly to comfort movements provided restoration of feather condition after extended hours of feeding during the night and in the early daylight hours. Swimming was recorded at similar levels during the day and night (Table 1), although a marginal increase occurred at night, suggesting that general activity levels were higher.

Use of image-intensifying passive binoculars for nocturnal observation can extend the study of bird behaviour to the whole of a 24-hour cycle. Use of this technique provides a new insight into the feeding ecology of Pacific Black Duck and may be appropriate for other species.

#### ACKNOWLEDGEMENTS

Thanks are expressed to Dr J. Gentili for encouragement in this field of research, and Dr S. Wheeler (Agricultural Protection Board) for loan of the night vision binoculars.

#### REFERNECES

- DWYER, T.J. 1975. Time budget of breeding Gadwalls. *Wilson Bull.* 87, 335-343.
- LAVERY, H.J. 1972. The Grey Teal at saline drought-refuges in north Queensland. *Wildfowl* 23, 56-63.
- NORMAN, F.I. THOMPSON, L.W. and HAMILTON, J.G. 1979. Use of habitat and diurnal activity of Pacific Black Duck, Chestnut Teal and Grey Teal at Serendip, Victoria. *Emu* 79, 54-62.
- PEDROLI, J.C. 1982. Activity and time budget of Tufted Ducks on Swiss lakes during winter. *Wildfowl* 33, 105-12.
- SKEAD, D.M. 1977. Diurnal activity budgets of Anatini during winter. *Ostrich Suppl.* 12, 65-74.
- SWANSON, G.A. and SARGEANT, A.M. 1972. Observation of Night-time Feeding Behaviour of Ducks. *J. Wildl. Mgmt.* 36, 959-61.
- TAMISIER, A. 1972. Rythmes nycthemeraux des sarcelles D'hiver pendant leur hivernage en Camargue. *Alauda* 40, 107-35; 235-56.
- TAMISIER, A. 1974. Etho-ecological studies of Teal wintering in the Camargue (Rhone Delta, France). *Wildfowl* 25, 107-17.
- TAMISIER, A. 1976. Diurnal activities of Green-winged Teal and Pintail wintering in Louisiana. *Wildfowl* 27, 19-32.
- WELLER M.W. 1974. Habitat selection and feeding patterns of Brown Teal (*Anas castanea chlorotis*) on Great Barrier Island. *Notornis* 21, 25-35.

#### THE RESULTS OF A BREEDING PROGRAMME FOR THE NOISY SCRUB-BIRD (*ATRICHORNIS CLAMOSUS*) IN CAPTIVITY.

By G.T. SMITH, C.A. NICHOLLS, L.A. MOORE and H. DAVIS, CSIRO, Division of Wildlife and Rangelands Research, Clayton Road, Helena Valley, W.A.

#### INTRODUCTION

Many techniques have been devised to aid the survival of rare and endangered birds (Temple 1977), one of which, captive propagation, often being considered a last resort (Conway 1977). While our attempts to breed the Noisy Scrub-bird in captivity were not a last resort, they were designed to provide the techniques and identify the problems, should such a move be necessary.